Specific Antidotal Information for Hospital Use

Atropine: There is really no "correct" dose! Dosage must be titrated to effect: drying of tracheal secretions, and resolution of broncho-constriction, and bradycardia. Atropine should be administered every 4-5 minutes until these end points are reached. Development of dilated pupils and tachycardia are NOT endpoints to use to stop atropinization! Unexposed patients exposed to these doses develop dilated pupils and tachycardias with heart rates well over 100 (usually increase of 35 bpm). Most of these effects dissipate in 4-6 hours but visual disturbances may last longer.

- Dose: preparations usually contain from 0.1 mg/ml to 1 mg/ml! **Check concentration carefully**; Mark 1 kits contain 2 mg in 0.7 ml
  - Pre-hospital
    - Adults should be given one injection intramuscularly of either Mark 1 autoinjector of atropine or 2 mg of commercial atropine every 2-5 minutes until pulmonary secretions are dry
      - Tachycardia and dilated pupils are not a contraindication to re-administration of atropine
    - Children above the age of 10 years should be treated as adults
    - Children less than 10 years of ages should be treated with intravenous, intra-osseous or intramuscular atropine at an initial dose of 0.02 mg/kg with a minimum of 0.1 mg and up to 0.5 mg as the first dose.
      - If IV access is unavailable and the child is seriously ill, a single 2 mg IM dose of atropine would be acceptable.
    - Children less than 2 years of age should be initially dosed at 0.1 mg and titrated to effect
  - Once hospitalized and when intravenous access has been secured, atropine should be given IV starting with standard ACLS or PALS doses, and then doubled every 2-5 minutes until control is obtained.

Pralidoxime: The dosage schedule for pralidoxime is not well established. The drug must be given in sufficient dose to reverse the effects of cholinesterase inhibition but given in excess can lead to respiratory arrest as well.

- Pralidoxime (2PAM) commercially available preparations contain 1 gram per 20 ml vials, Mark 1 kits contain 600 mg in 2 ml auto injectors.
  - Indications
    - Any neuromuscular weakness.
    - More than a single dose of atropine may be required to control symptoms.
    - Dose:
      - Adults
        - Administer Mark 1 autoinjector or praladoxime, IM every 2-5 minutes simultaneously with atropine as necessary up to 3 doses.
      - Children above age 10 can be treated as adults.

Note: This information was produced in consult with the New Jersey Poison Information and Education System.

    - Smaller children should be treated intravenously if possible at a dose of 25-50 mg/kg up to 1-2 grams given as a 5% solution or less over no faster than 20-30 minutes.
    - If intravenous access is not available, a single 600 mg dose IM would be acceptable in any child above 10 kg.
    - Even smaller children may be treated based on the urgency.
  - For all patients: Once intravenous access has been established, all patients should be treated IV at a dose of 25-50 mg/kg up to 2 grams in adults, given over no faster than 20-30 minutes. Many recommend 500 mg/hr in adults and 10-20 mg/kg/hr in children
- Benzodiazepines are indicated for all patients with seizures or signs of agitation as they have been shown to improve survival in animal models.
  - Standard doses of lorazepam or diazepam should be used.

Sodium nitrite: intravenous sodium nitrite is the currently preferred antidote in the face of apparent cyanide poisoning. Toxicity is related to hypotension and the production of methemoglobinemia. Methemoglobinemia SHOULD NEVER BE REVERSED when used to treat cyanide poisoning!

- If the patient has not responded to oxygen and amyl nitrite treatment, infuse sodium nitrite intravenously as soon as possible.
  - The usual adult dose is 10 mL of a 3% solution (300 mg) infused over **absolutely no less than 5 minutes**;
  - The average pediatric dose is 0.12 to 0.33 mL/kg body weight up to 10 mL infused as above.
  - Monitor blood pressure during sodium nitrite administration, and slow the rate of infusion if hypotension develops.
  - If the patient does not respond within 20-30 minutes of the first dose, based on correction of metabolic acidosis and production of a methemoglobin level of over 10%, a second dose may be administered at ½ the previous dose.

Sodium thiosulfate: if there is a mass casualty situation and there may be both a question of exact identification of the agent involved and difficulty with monitoring of all of the victims, it may be wise to use high flow oxygen, sodium bicarbonate treatment of acidosis and sodium thiosulfate in lieu of sodium nitrite. Thiosulfate is essentially non-toxic but some patients may develop nausea, vomiting and pain at the injection site.

- Infuse sodium thiosulfate intravenously.
  - The usual adult dose is 50 mL (one vial) of a 25% solution (12.5 g) infused over approximately 10 minutes;
  - If nitrites are not given, many authorities recommend that thiosulfate be infused more rapidly (over 2-5 minutes)
  - The average pediatric dose is 1.65 mL/kg of a 25% solution.
  - Repeat one-half of the initial dose 30 minutes later if there is an inadequate clinical response.

For further help call: POISON Help™ 1-800-222-1222

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